SOUTH CAROLINA PUBLIC SERVICE COMMISSION
DOCKET NO. 96-001-E
DIRECT TESTIMONY OF CAROLINA POWER & LIGHT COMPANY
WITNESS HUGH K. EVANS

Q. Mr. Evans, will you please state your full name, occupation, and address?

A. My name is Hugh K. Evans. I am employed by Carolina Power & Light Company as Manager - System Operations. My business address is 411 Fayetteville Street Mall, Raleigh, North Carolina.

Q. Please summarize briefly your educational background and experience.

A. I graduated from North Carolina State University in 1964 with a B.S. Degree in Electrical Engineering. Following graduation, I served in the U.S. Army as Lieutenant for two years. I am a member of IEEE and the Power Engineering Society.

After discharge from the U.S. Army in 1966, I joined Carolina Power & Light Company working in the Relay Section as an Electrical Engineer for two years. From 1968-1977, I worked with CP&L's Employee Relations Department in Management Development. Since 1977, I have held positions at various locations within the company such as Manager-Fossil Operations Administration, Assistant to Vice President-Fossil Operations, Manager-Lee Plant, and Manager-Energy Control Center. In 1990, I was named to my present position as Manager of System Operations. I am responsible for the economic and reliable operation of CP&L's generation and transmission resources.

Q. What is the purpose of your testimony here today?

A. The purpose of my testimony is to review the operating performance of the Company's generating facilities during the period of July 1, 1995 through December 31, 1995 and the expected operating performance of the nuclear units for the projected period April 1, 1996 to September 30, 1996.

Q. Describe the types of generating facilities owned and operated by CP&L.

A. CP&L owns and operates a diverse mix of generating facilities consisting of hydro facilities, combustion turbines, fossil steam generating facilities, and nuclear plants.

Q. Why does CP&L utilize such a diverse mix of generating facilities?

A. Each type of facility has different operating and installation costs and is generally intended to meet a certain type of loading situation. In combination, the diversity of the system allows CP&L to meet the continuously changing customer load pattern in a reasonable, cost-effective manner. The combustion turbines, which have relatively low installation costs but higher operating costs, are intended to be operated infrequently. They also provide resources that can be started in a relatively short time for emergency situations. In contrast, the large coal and nuclear steam generating plants have relatively high installation costs with lower operating costs, and are intended to operate in a manner to meet the constant level of demand on the system. Based on the load level that CP&L is called on to serve at any given point in time, CP&L selects the combination of facilities which will produce electricity in the most economical manner, giving due regard to reliability of service and safety. This approach provides for overall minimization of the total cost of providing service.

Q. Please elaborate on the intended use of each type of facility CP&L uses to generate electricity.

A. As a general rule, peaking resources such as combustion turbines, are constructed with the intention of running them very infrequently, i.e. only during peak or emergency conditions. Therefore, as a rule, they have a very low capacity factor, generally less than 10%. Because combustion turbines can be started quickly in response to a sharp increase in customer demand, without having to continuously operate the units, they are very effective in providing reserve capacity. Intermediate facilities are intended to operate more frequently and are subject to daily load variations. Because these facilities take some time to come from a cold shut down situation, they are best utilized to respond to the more predictable system load patterns. Additionally, these plants, located across the Company's service territory, contribute to overall system reliability. As a rule, they operate with capacity factors in the range of 10% to 60%. CP&L's intermediate facilities are predominately older coal plants. Baseload facilities are intended and designed to operate on a near

continuous basis with the exception of outages for required maintenance, modifications, repairs, major overhauls, or for refueling in the case of nuclear plants. These plants are traditionally called on to operate in the 60% and greater capacity factor range. CP&L's four nuclear units and four larger coal units constitute the Company's baseload facilities.

Q. How does CP&L ensure that it operates these three types of generating facilities as economically as possible?

A. The Company has a central Control Center which monitors the electricity demands within the CP&L service area. The control center regulates and dispatches available generating units in response to customer demand. Sophisticated computer control systems match changing load with available sources of power. Personnel at the energy control center, in addition to being in contact with the Company's generating plants, are also in communication with other utilities bordering our service territory. In the event a CP&L plant is suddenly forced off-line, the interconnections with neighboring utilities help to ensure that service to our customers will go uninterrupted. Additionally, it allows CP&L access to the unloaded capacity of neighboring utilities so that CP&L customers will be served by the lowest cost power available through inter-utility purchases.

Q. During the review period July 1, 1995 through December 31, 1995, did CP&L prudently operate its generating system within the guidelines discussed in regard to the three types of facilities?

A. Yes. Two different measures are utilized to evaluate the performance of generating facilities. They are equivalent availability factor and capacity factor. Equivalent availability factor refers to the percent of a given time a facility was available to operate at full power if needed. Capacity factor measures the generation a facility actually produces against the amount of generation that theoretically could be produced in a given time period, based on its maximum dependable capacity. Equivalent availability factor describes how well a facility was operated, even in cases where the unit was used in a load following application. CP&L's combustion turbines

averaged 93.6% equivalent availability for the six-month review period ending in December 1995, and less than 1.3% capacity factor indicating that they were almost always available for use but operated minimally. This is consistent with their intended purpose. CP&L's intermediate, or cycling units, had an average equivalent availability factor of 89.3% and a capacity factor of 53.0%, again indicative of good performance and management. CP&L's fossil baseload units had an average equivalent availability of 87.7% and a capacity factor of 62.7%. The fossil baseload capacity factor was lower than usual due to excellent nuclear performance during the six-month review period. Thus, the fossil baseload units were very well managed and operated during the six-month period. CP&L's Brunswick Units l and 2, Robinson Unit 2 and Harris Unit 1 nuclear units had capacity factors of 99.2%, 87.5%, 100.2%, and 60.0% respectively for the six-month review period. The overall nuclear system capacity factor was 85.5%. This high capacity factor demonstrates that CP&L properly managed its nuclear system. Brunswick Unit 2 operated continuously for the entire test period. Brunswick Unit 1 and Robinson Unit 2 operated continuously except for certain minor brief outages. The capacity factor of Harris Unit 1 was reduced during the period under review because it experienced a planned refueling and maintenance outage. The capacity factor of Brunswick Unit 2 was reduced because it was coasting down to a refueling outage during the latter portion of the test period. Also during the test period, Brunswick Unit 2 set a new boiling water reactor ("BWR") world record for continuous operation. As of February 1, 1996, Brunswick Unit 2 has operated continuously for 581 days compared to the previous BWR operating record of 533 days. In addition, the Company achieved a new CP&L record for nuclear generation for the year 1995. CP&L's nuclear units produced 23.1 billion kWh in 1995, 7.7% more than 1994 which was the previous record.

Q. You have not specifically addressed the performance of CP&L's hydro units. Please discuss their performance.

A. The usage of the hydro facilities is limited by the availability of water that can be released through the turbine generators. The Company's hydro plants have very

limited ponding capacity for water storage. CP&L does operate the hydro plants to obtain the maximum generation from them; but because of the small water storage capacity available, the hydro units have been primarily utilized for peaking and regulating purposes. This maximizes the economic benefit of the units. For the review period the hydro units had an equivalent availability of 96.5% and operated at a capacity factor of 38.5%.

Q. How did the Company's fossil units perform as compared to the industry?

A. Our fossil steam system operated well during this review period, achieving an equivalent availability of 88.4%. This exceeds the most recently published North American Electric Reliability Council (NERC) average equivalent availability for coal plants of 82.3%. The NERC average covers the period 1990-1994 and represents the performance of 883 units. Equivalent availability is a more meaningful measure of performance for coal plants than capacity factor, because the output of our fossil units varies significantly depending on the level of system load. Our larger fossil units, Roxboro Units 2, 3, and 4 and Mayo Unit 1, operated at equivalent availabilities of 77.3%, 96.5%, 89.9%, and 86.5%, respectively. As I mentioned earlier, the baseload coal units achieved an average equivalent availability of 87.7%.

Q: How did the performance of CP&L's nuclear system compare to the industry average?

A: During the period July 1, 1995 through December 31, 1995, CP&L's pressurized water reactors ("PWRs"), Robinson Unit 2 and Harris Unit 1, achieved capacity factors of 100.2% and 60.0% respectively. On average, these nuclear units operated at 77.8% capacity factor during the test period. In contrast, the NERC five-year average capacity factor for 1990-1994 for all commercial PWRs in North America is 72.8%. Brunswick Units 1 and 2, which are both boiling water reactors ("BWRs"), achieved capacity factors of 99.2% and 87.5%, with an average of 93.4%. The NERC five-year capacity factor average for 1990-1994 for all BWRs is 62.9%. CP&L's nuclear system incurred only a 3.9% forced outage rate during the test period compared to the industry average of 10.8%. A low forced outage rate of this level on a 6-month basis, relative to the longer period industry average, is clearly indicative of superior performance during the review period.

Q. Are you presenting any exhibits with your testimony?

A. Yes. Evans Exhibit 1 is a graphic representation of the Company's generation system operation for the six-month review period.

Q. Does this conclude your testimony?

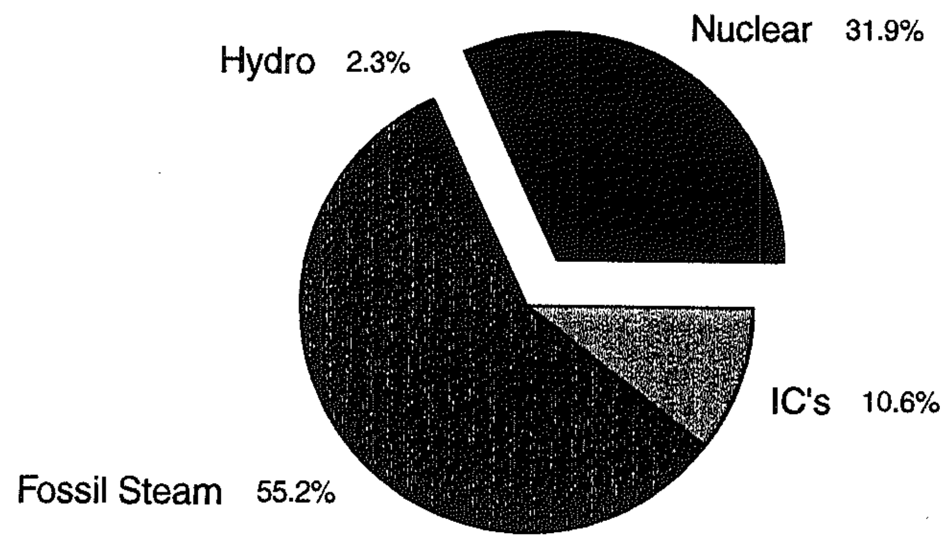
A. Yes.

20854

Evans Exhibit 1

Comparison of Installed Capacity to Actual Generation Mix 7/1/95 - 12/31/95

Installed Capacity



Generation Mix

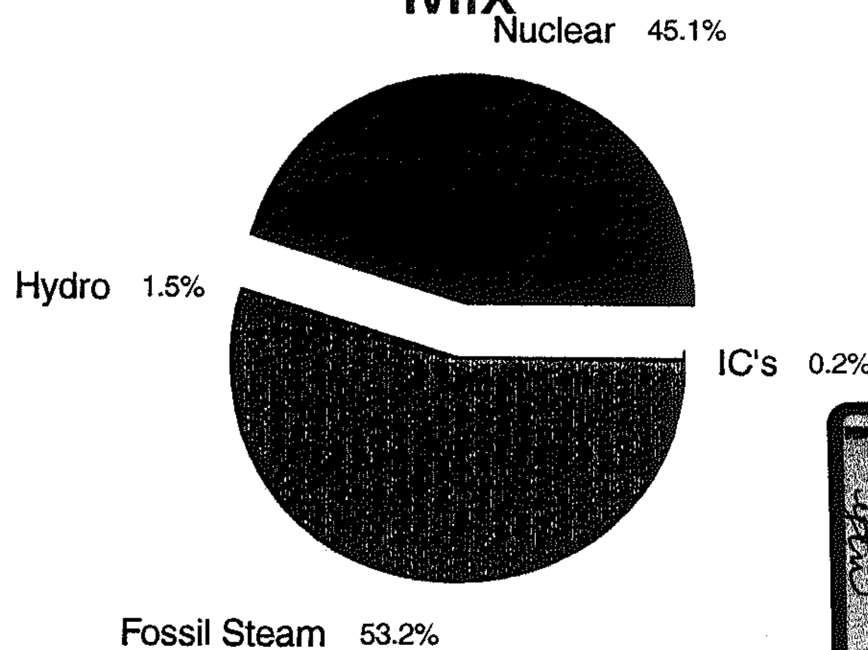


EXHIBIT #2 MFI-AIE (9443) 3-14-96

CP&L's Nuclear system, which represents about 32% of installed capacity, produced over 45% of the generation.